INTERNATIONAL CIVIL AVIATION ORGANIZATION
SOUTH AMERICAN REGIONAL OFFICE

FOURTH INFORMAL MEETING ON THE PLANNING AND IMPLEMENTATION OF THE SAM DIGITAL NETWORK

(REDDIG/4)

(Lima, 4 to 8 September 2000)

Agenda Item 3: Administrative aspects for the implementation and operation of the REDDIG
Proposals for the network management

(Presented by the Secretariat)

Summary

This working paper is aimed at establishing the possible options that could be handled in order to set up a survey and control system of the REDDIG (*Network monitoring system* – NMS) as well as the space segment payment once the first six months of the network operation have elapsed.

1. Introduction

1.1 In paragraph 4.5 of the Technical specification documents are established the requirements of the Network monitoring System (NMS). This system that must be based on SMMP protocol, will allow the monitoring of all nodes, systems, subsystems and equipments that are part of the REDDIG network.

1.2 The NMS system is composed by two functions. One local NMS, that is included in the equipment that will be installed in each node, and one NMS administrator, that will be unique in each moment. It is established in the project document (see activity 2.1.1), that the Project Office will be in charge of this duties during the following six months to the network cutover.

1.3 In this working paper it is examined, the future operation of the REDDIG, once the results of the initial stage are evaluated (activity 2.1.5).

1.4 In the 2.2 result of the REDDIG Project Document (RLA/98/019), appears the activity 2.2.1, which proposes the evaluation of the different alternatives for the establishment of a multinational mechanism for the network administration. This working paper advances this activity for the meeting consideration in view of its deep influence in the project execution.

2. Analysis of the alternatives for the network management

2.1 The project has considered convenient to present to the meeting three (3) networks management and monitoring alternatives. It means three (3) possibilities for the assumption of the global network responsibility. The duties of the network administrator are complex and involves not only the real control of the transmission parameters in each node, but also the control of the configuration modifications, the habilitation of new services if necessary, besides the permanent communication with the INTELSAT service provider for the coordination process of the acceptance tests in stations, failure in RF elements that affect the transmission levels, systems updating, etc.

2.2 Option A: The network administration through an ICAO mechanism

2.2.1 Under this method, ICAO is in charge of making the space segment payments to the service provider. As detailed in WP/07, with this method the project will take advantage of the character of the ICAO for being a United Nations agency. It is possible to arrange that a technical cooperation mechanism of the ICAO be in charge not only in the administrative matters with the service provider but also be responsible of the technical administration of the REDDIG during its useful life time.

2.2.2 The advantages of holding a supranational entity as supervisor not only are in the responsibility assumed by direct entrusted by the participant States, but also in handling matters regarding the permanent technology updating, implementation of new common global services, picking up the particular needs of each Estate applying regulations according with the ICAO recommendations that can appear in regard of the air navigation plan, particularly for the coordinated implementation of the CNS/ATM systems, that will be implemented on 2004 and that was considered in the Technical specifications document of the REDDIG with the correspondent SARPs.

2.2.3 This option will be valid if there is an agreement between the REDDIG participant States. It involves a study carried out by both ICAO and States about the definitive scheme of this option. This study should consider, among others, the development of additional training courses for the States personnel during the network useful lifetime.

2.2.4 This option requires a fluid relationship between the Contractor and the ICAO that guarantees the logistic and updating during the network useful lifetime.

2.3 Option B: The network administration in charge of the REDDIG participant States

2.3.1 This option presents two different possibilities, the first where a States is engaged with the REDDIG administration during the network useful lifetime, and the second where is habilitated a transference protocol between several States.

2.3.2 In the first option the space segment payment by a State could imply a variation in the dealing with the service provider, because of the addition of another entity (an State signatory) in the process. This signatory imposes a markup (an additional cannon in the space segment) that will affect the whole space segment leased. Another interesting possibility that appears while studying this option is that the State elected to carry on the REDDIG administration shall transfer to ICAO the administrative procedures with INTELSAT as well as the collecting of the space segment cost from the States.

2.3.3 This option should imply that the remainder administrations involved get the commitment to pay as agreed between them, the expensed resulting from the administration of the State entrusted with the task.

2.3.4 The second option implies a rolling procedure of the administration responsibility between the nodes that are able to assume it. In Appendix A to this working paper it is established for the meeting consideration, a draft version of the survey protocol for this case. Usually, the service provider do not accept a constant change of signatory, so due to the complex of this option does not allow the States to carry out the administrative duties, that must be carried on by the ICAO. This option also presents an additional trouble in sharing the costs of the administration between the States, due that some States will not be able to face the administration during the whole network useful lifetime.

2.4 Option C: The network administration in charge of the Contractor or an added service company

2.4.1 In this option presented to the meeting for its consideration, appear again different methods of space segment payment; through ICAO, taking advantage of its signatory condition or through the Contractor or another Added Service Company appointed for this purpose. There are several companies on the communication, satellite or engineering added services that are INTELSAT signatories due to the volume of service produced. It cannot be predictable that the Contractor will be an INTELSAT signatory but it can be foreseen the introduction of a markup, which value average, should be negotiated opportunely.

2.4.2 This option presents both advantages and inconveniences. The main advantage is the supranational entity (see Option A) that is able to bill independently to each node or State. The value of this bill is out of control, although it must be negotiated opportunely. By the way, a State or the ICAO must be empowered to negotiate this service, for which an agreement should be taken by the participant States.

2.4.3 Another inconvenience is the future bill increases for the services. In this option the company services are engaged with the network existence, so not only the control of the network is loosed, but also the real value of this service in the market for being this owner service, vital for the network.

3. Conclusions

3.1 From the above considerations, it is conclude that the meeting should discuss as an urgent matter, the activities 2.2.1 and 2.2.2 or the project document RLA/98/019, taking into account:

a) The REDDIG network administration should be considered as the base over where it must be supported the network future and the implementation of the CNS/ATM systems mentioned in the air navigation plan.

b) The solution agreed to take should be approved by all REDDIG participant States, due to there will not be a possibility of a unique network administrator without the participation of all their members.

c) As an urgent matter, the REDDIG administrator must be designated by all the participant States before the network cutover.

d) The features originated in the space segment cost, as they are permanent and not payable off.

e) That it is important for the project development that the States decide in the REDDIG/4 Meeting the adoption of a method as to how to manage the REDDIG network in order that based in this orientation the activity 2.2.2 and followings of the REDDIG project can be developed.

4. **Suggested action**

4.1 The meeting is invited to consider the information provided in this working paper as to examine the different options that allows the election of the more suitable mechanism for the States interests regarding the future administration of the REDDIG.

APPENDIX A

DRAFT VERSION OF THE PROTOCOL TO THE TRANSFERENCE OF THE REDDIG SURVEY AND CONTROL RESPONSIBILITIES

1. Introduction

1.1 This draft is composed in case of the assumption of the network survey and control tasks by several REDDIG participant States. This draft in only informative and is aimed at explaining the actions that should be taking in the transfer of the responsibility in a specific moment.

2. Objectives

2.1 The objective of this document is to define the administrator active method (Active supervisory node - ASN).

2.2 This protocol includes the functions that the ASN will take on and the regulations that will permit the transference of responsibilities from the ASN to another node as a result of an agreement or due to a failure in the administrator node that causes its lack of skill for assuming the entrusted tasks.

2.3 This protocol includes three main element s as follows:

a) Local network monitoring system (NMS local)
b) Management network system (NMS administrator)
c) Relationships with foreign entities

3. Definitions

3.1 The following definitions are applied in the whole document:

a) ASN (Active Supervisory Node)
In the active network administrator node, that is for definition exclusive in each moment.

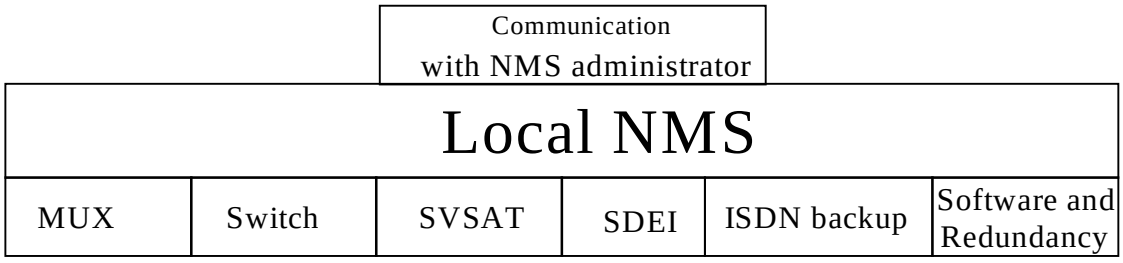
b) BSN (Backup Supervisory Node)
Is the node able to assume the administration tasks at any moment, acting as alternative administrator node while another node holds its ASN position.

c) Survey protocol
Is the group of regulations and proceedings through the REDDIG administration is manage, and that involves the ASN and BSN node responsibilities, the temporal distribution of the responsibilities between both nodes (ASN and BSN) and the transference protocol of those tasks in case of failure.

4. Levels of responsibility

4.1 Local NMS

4.1.1 The following picture describes the supervision level of the local NMS:



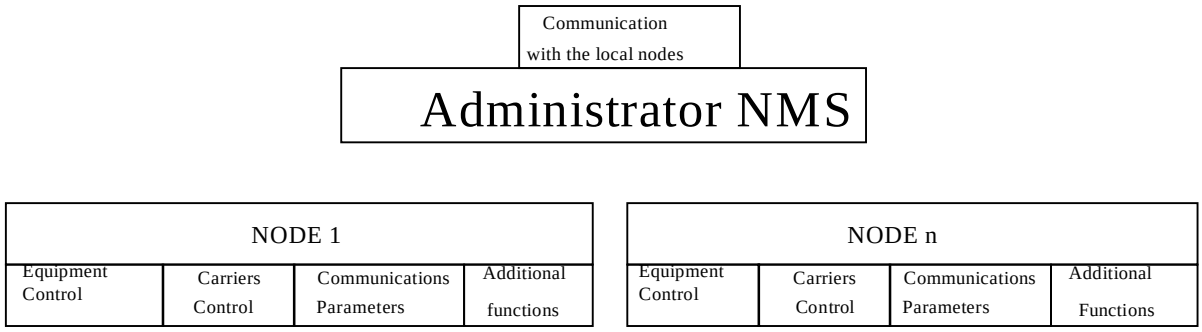
4.1.2 The local NMS responsibilities are condensed in the monitoring of all node elements included in the above picture, as well as the performance included in the Technical specifications document. The network administrator carries out the control of the node elements.

4.1.3 The local NMS system visualizes continuously the real situation of each nodes equipment, through a pooling function in the supervisor computer that includes the NMS system. This unit will detect any failure immediately and will report it to the NMS system of the administrator node.

4.1.4 This communication with the administrator node is one of the added value services that are implemented in the REDDIG, as a data communication sub-network.

4.2 Administrator NMS

4.2.1 The following pictures describes the NMS supervision levels of the administrator:



4.2.2 The local NMS responsibilities are summarized in the monitoring and control of all the elements of the nodes included in the above picture, as well as all the functions included in the Technical specifications document among those, the related with the control of the carriers level and other communications parameters.

4.2.3 As additional functions are, among others, the NMS administrator capacity (ASN) of transfer responsibilities of one or all tasks of the node equipment and the total supervision of them.

4.2.4 The necessity of measure equipment and tools of the node that act as NMS administrator (ASN) will be at least the following:

a) One spectral analyzer (of until 2 GHz).
b) Access to the total functions of the NMS system

4.2.5 The node that acts as NMS administrator (ASN) must guarantee the presence of exclusively dedicated personnel 24 hours per day, the 7 days per week.

4.3 Relationship with foreign entities

4.3.1 The relationship with foreign entities includes the protocol and the required communications to interact with external agents of the REDDIG network. This relations are in charge of the node that acts as NMS administrator (ASN). Between its objectives are:

a) Communication with the service provider INTELSAT
The ASN node must nominee a person or a group of contact with INTELSAT, for coordinate with this organization all matters regarding the carriers and radio frequency magnitudes. This contact must be habilitated 24 hours per day.

b) Coordinate all the necessary contacts with the Contractor and keep the inventory of all spare parts and measure equipment of all the network nodes as well as the systems updating.

c) Coordinate the use of spare parts in all nodes, sending the replaced parts as soon as possible to the Contractor for its fixing, verifying the situation of the warranty of this part.

5. ASN/BSN responsibilities distribution

5.1 The nomination of a node as ASN or BSN is fasten to the following regulations and procedures:

a) Can be appointed ASB/BSN any REDDIG node that request and that demonstrates its capacity of assuming the functions described in this protocol and in the REDDIG Technical specifications document.

b) Before a node designation as administrator, it should demonstrate that accomplishes with the technical requirements and the human resources in order to perform this task in an uninterruptible way for at least one (1) year.

c) Likewise, it must posses ISDN support lines, international access to the public network (DDI), the necessary measure equipment, capacity for prepare spare parts inventories, including its warranties, etc.

5.2 The procedures of responsibilities alternation and rolling between ASN and BSN nodes should accomplish with the following:

a) In case of an agreement of adopting the roll NMS administrator (ASN) between several States, the responsibility will be assumed by the ASN and BSN node simultaneously for an initial period not shorter that one (1) year.

b) After this period, the BSN node will assume the functions of the administrator (ASN) and will transfer to another node the BSN node responsibility for a period of one (1) year.

c) The ASN node will be able in its period of execution, to delegate its responsibilities to the backup node (BSN) if:

aa) Request to the BSN to assume the ASN responsibilities with at least one (1) month in advance.

bb) The ASN node is declared unable to carry out its responsibilities as NMS administrator node. So the BSN node assumes the administration immediately and must be prepared for it all the time.

cc) The NSN node that will act as ASN node (case bb) for at least fifteen (15) days, will become as ASN node of full right and will appoint a new backup node (BSN).

dd) INTELSAT should be immediately informed of any modification on the focal point raised from the transfer of responsibilities.